

# Call for Papers

## The 1st Online Conference on Nonlinear Dynamics and Complexity

November 23-25, 2020, Central Time Zone, USA

This Conference will provide a place to exchange recent developments, discoveries and progresses on Nonlinear Dynamics and Complexity. The aims of the conference are to present the fundamental and frontier theories and techniques for modern science and technology; to stimulate more research interest for exploration of nonlinear science and complexity; and to directly pass the new knowledge to the young generation, engineers and technologists in the corresponding fields.

The symposium will focus on the recent developments, findings and progresses on fundamental theories and principles, analytical and symbolic approaches, computational techniques in nonlinear physical science and nonlinear mathematics

Authors are encouraged to present a paper for publication in the edited book. The high-quality papers will be selected for publication in a Journal

<http://ndc.lhscientificpublishing.com/program/>

### **Symposium-9: Challenges and Research Directions in Nonlinear Behavior and Their Controls of an Atomic Force Microscopy (Afm) Vibrating Systems**

Nowadays, Atomic Force Microscope (AFM) has become a useful tool for direct measurements of intermolecular forces with atomic precision. This microscope can be used in various fields such as semiconductors, manufacturing, polymeric materials, bio-analysis, biomaterials, and in the studying of metal surfaces. (AFM) robot is a powerful tool for nano-level evaluation, biomaterials diagnosis, nano description of materials and equipment, and assembly at nanoscale. (AFM) has a cantilever with a probe of a very fine tip, by which the information from the sample and tip interaction can be obtained. The accuracy of power estimation based on AFM measured information depends on the selected dynamic model for the

cantilever. With its effect on the controlling system, the dynamic system model directly affects the image resolution.

This symposium aims to creating a multidisciplinary forum of discussion on recent advances in nonlinear dynamics techniques and nonlinear control applied to engineering systems, as well as new development areas, that is, providing a forum for the discussion and dissemination of the latest approaches, methodologies results and current challenges in nonlinear vibrations- field of Atomic Force Microscopy (AFM) vibrating systems. We will deal with the goals: physical phenomena involved, adequate methodology to deal with them and a report of selected papers published recently, and in the past.

All papers will be peer-reviewed, and upon acceptance, they will be published in the special issue of an indexed journal Manuscripts . Manuscripts are solicited in topics including, but not limited to:

- Nonlinear mathematical modeling of vibrating motion of nanomechanical cantilever active probe
- Time, Series Analysis Generated by a Sensor of an (AFM)
- Preventing Chaotic Motion in Tapping-Mode in (AFM) systems
- Robustness of attractors in tapping mode in (AFM) systems
- Attractors robustness and basins integrity of noncontact AFM)
- Nonlinear dynamic behavior of (AFM) in trolling mode
- (AFM) Nonlinear motion control with robustness analysis to parametric errors in the control signals
- Dynamic analysis and Control of fractional (AFM) systems
- Biological Applications of the AFM
- Application of (AFM)on Sedimentary Rocks
- Phase-Locked Loop design applied to frequency-modulated in (AFM) systems
- Emerging topics in (AFM) systems

### **Abstract**

Would like to submit an abstract?

**Deadline: September 30, 2020**

### **Full-length Paper**

Would like to submit a paper?

**Deadline: January 30, 2021**

**Chair:**

Professor José Manoel Balthazar  
UNESP-Universidade Estadual Paulista, Bauru-SP, Brasil and Universidade  
Tecnológica Federal do Paraná, Ponta Grossa, PR, Brazil  
Email: [jmbaltha@gmail.com](mailto:jmbaltha@gmail.com)

**Co-Chairs:**

Professor Ângelo Marcelo Tusset  
Universidade Tecnológica Federal do Paraná, Ponta Grossa, PR, Brazil  
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Dr. Mauricio Aparecido Ribeiro Bueno  
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Email: [mau.ap.ribeiro@gmail.com](mailto:mau.ap.ribeiro@gmail.com)

## Registration

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| \$75 | Early Registration (by November 10, 2020)              |
| \$50 | Early Student Registration (by November 10, 2020)      |
| \$90 | Regular Registration (after November 10, 2020)         |
| \$60 | Regular Student Registration (after November 10, 2020) |

There will be financial aid available to defray the registration fee of conference participants. Please reach out to conference chairs for consideration.

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